

CLAIMS

1. Method of obtaining a radiographic image of a tooth and of its surrounding area, characterised in that it comprises:

emitting a bundle of X-rays in the direction of said tooth and its surrounding area,

guiding the X-rays, which emerge from said tooth and its surrounding area, in substantially cylindrical volumes substantially along the axis of said volumes,

transforming the X-rays, when they are guided in said cylindrical volumes, into light rays of a greater wavelength than that of the X-rays,

converting these light rays into electrical signals, and

processing these electrical signals to produce said radiographic image.

2. Method according to claim 1, characterised in that it also comprises filtering said electrical signals in dependence on predetermined criteria.

3. Method according to one of the preceding claims, characterised in that said light rays are converted into analogue electrical signals, and in that these said analogue electrical signals are converted into digital electrical signals.

4. Method according to one of the preceding claims, characterised in that it comprises amplifying at least one portion of said electrical signals according to a predetermined function.

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5. Apparatus for accomplishing the method according to one of the preceding claims, characterised in that it comprises:

a source (1), which is capable of emitting a bundle of X-rays towards said tooth (4) and its surrounding area (5),

a plurality of cylindrical rods (10), which are produced from a material capable of transforming the X-rays into light rays (11) of a wavelength greater than that of the X-rays, each rod comprising an inlet face (12), which is capable of receiving said X-rays, and an outlet face (13), which is capable of emitting said light rays (11), said cylindrical rods (10) being disposed side by side so that all of the inlet faces (12) are turned towards said X-ray source (1),

means (20) for converting light rays (11) into electrical signals,

means (30) for connecting the outlet faces (13) of the cylindrical rods to said means (20) for converting light rays into electrical signals, and

means (70) for processing said electrical signals with a view to producing said radiographic image.

6. Apparatus according to claim 5, characterised in that the means (20) for converting light rays into electrical signals comprise a converter (21) for converting light rays into analogue electrical signals and a converter (22) for converting analogue electrical signals into digital electrical signals, the inlet (23) of which latter converter is connected to the outlet (24) of the converter for converting light rays into analogue electrical signals.

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7. Apparatus according to claim 6, characterised in that said converter (21) for converting light rays into analogue electrical signals is formed by a CCD bar, and in that said converter (22) for converting analogue electrical signals into digital electrical signals is a CAN converter of the type which has at least twelve bits.

8. Apparatus according to one of claims 5 to 7, characterised in that it also comprises means (40) for filtering said electrical signals.

9. Apparatus according to claim 8, characterised in that said means (40) for filtering the electrical signals comprise at least one of the following three filters: a low-pass filter (41), which is capable of eliminating the electrical signals corresponding to the X-rays after they have traversed the most opaque parts of said tooth (4) and its surrounding area (5), a band-pass filter (42), which is capable of allowing the electrical signals corresponding to the X-rays to pass therethrough after they have traversed the dentine of the tooth and the material parts of its surrounding area substantially equivalent to this dentine, and a high-pass filter (43), which is capable of eliminating the electrical signals corresponding to the X-rays after they have traversed soft tissues or the like of the tooth and its surrounding area.

10. Apparatus according to claim 9, characterised in that it also comprises means (50) for amplifying the electrical signals obtained at the outlet (44) of at least one of the three filters (41-43), according to a predetermined function.

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11. Apparatus according to one of claims 5 to 10, characterised in that the means (70) for processing said electrical signals with a view to producing said radiographic image comprise at least one of the following elements: a temporary memory, a permanent memory or a converter for converting electrical signals into video signals which are capable of being displayed on a screen.
12. Apparatus according to one of claims 5 to 11, characterised in that said cylindrical rods (10) are produced from caesium iodide crystal.
13. Apparatus according to claim 12, characterised in that said cylindrical rods (10) have a substantially cylindrical revolving configuration, with a length of between 80 and 200 μm , for a diameter of between 3 and 7 μm .
14. Apparatus according to one of claims 5 to 13, characterised in that said cylindrical rods (10) are in contact with one another to form a mosaic.
15. Apparatus according to one of claims 5 to 14, characterised in that the means (30) for connecting the outlet faces (13) of the cylindrical rods (10) to said means (20) for converting light rays into electrical signals comprise a bundle of optical fibres.

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